-:- Editorially Speaking -:-

ENROLLMENT—NOT DEFERMENT IS THE ANSWER TO THE CRITICAL SITUATION IN ENGINEERING

The article in this issue of the PYRAMID by Dean Hollister should be read by every American who believes in the economic future of the United States.

He says that in 1949 industry—the American economic system—easily absorbed 50,000 graduating engineers. Our normal requirements for many years will be about 30,000 graduating engineers. Yet in 1954 only a little over 12,000 will be available!

It has been our experience that when anything is in short supply the standard of living has been adjusted downward to meet the situation. A wholly inadequate supply of engineers is no different than a wholly inadequate supply of steel. Progress stops! Retrogression sets in.

The situation presents an interesting challenge to industrial leaders as well as engineers. What can be done about it?

The answer is obvious—increase the enrollment of qualified students in engineering colleges. But *who* shall do it? In Russia the answer is simple—the government. People do not count in Russia except to be used as raw material by the state.

But people do count in the United States. The people must exercise the right to choose a profession. If enough young men do not choose engineering as a profession, something drastic will have to be done about it.

With this thought in mind, the editor reflects on the potentialities of Sigma Tau in such a crisis. Suppose every one of our 16,000 alumni should address the graduating classes in every high school community where Sigma Tau members are found. Suppose these thousands of Sigma Tau members should get behind this effort to increase the enrollment in engineering colleges.

What do you think of the idea?

1951

ENGINEERS AND TOMORROW

By Murry A. Wilson, Epsilon '52

It is not surprising that young men now attending college and those who have recently graduated are filled with forebodings as to what the future may have in store for them. This feeling prevails among young engineers and engineering students just as much or possibly more than it does among students in other fields. And it is certainly understandable in view of the conditions which obtain in our world today. The international news is all disturbing; each day brings a new crisis which our leaders apparently are ill-prepared to meet. On the national scene, confusion reigns in every phase of the national government and this feeling of indecision, uncertainty, and inability to find the right answer has filtered down and is permeating every phase of our activity, both political and economical.

So in spite of the well known injunction to "take no thought of the morrow", it is natural and proper to consider the conditions that exist around us and to attempt to ascertain what the future may have in store for us. I am not, however, attempting to make any prognostications on the political outcome of the present emergency. It is enough, I think, to point out that every generation in the past has had its pet emergency, and many times in the course of history, leaders have sat down in despair and asserted that the outlook was entirely hopeless. So if we can believe that history repeats itself, we can comfort ourselves by the assurance that the emergency which now confronts us is no more grave than many of the others which have confronted the nations of the so-called civilized world during the past thousand years. We should be able to find comfort in the thought that these ancient emergencies all passed by and were eventually solved in some way or other and human life continued to go on to a better existence than had been enjoyed before.

But I want to talk about engineering in particular rather than the political situation, and try to find out if there is any ray of hope for the engineering profession in the gloomy outlook which the future presents to us. Let us look backward for a minute and consider the growth and gains of the engineering profession in the past. We may say that engineering, as we know it now, was born in the industrial revolution of England which took place, or rather had its inception, in the period between 1760 and 1790. It was during these years, which you will note is the span of one average lifetime as of that period, that machinery began to take the place of handwork and mass production as a means of increasing the productivity of laborers was first introduced to our

civilization. Of course, even at that time nobody called them engineers, but the changes which took place, the moving of industry from the homes to the factory, the substitution of machines for individual labor, all helped to the development of present day engineering.

The period to which I refer was one of world-wide unrest. It was a period of colonization, and development beyond what had been seen previously. It is interesting to note that during this period the Spaniards were colonizing Northern Mexico, California and the great Southwest. The American colonies won their independence from Britian and established the United States. In France, the old government gave way before the violent French Revolution. And while unrest was universal, the "Industrial Revolution" was laregly confined to England.

The first half of the next century saw the same sort of development and change on this side of the Atlantic. It was a period of expansion, and all sorts of citizens of the newest republic were pushing ever westward for more room and more wealth and more honor. The beginning of the period saw the Louisians Purchase and the close of the period saw the armies of the United States push clear to the Pacific Ocean. On top of this expansion and colonization, and in addition to the industrial development which was destined to revolutionize our way of living, the United States indulged in two wars, the war of 1812 with Great Britian and the war with Mexico in 1846. The first resulted in the burning and sacking of Washington, but ultimately brought about the freedom of the seas. The latter resulted in the annexation of California and the great Southwest.

This period, that is, the first half of the 19th Century, with its industrial revolution and its emphasis on manufacturing, with the importance which came to be attached to technological brains and technological skill, paved the way for the development of the engineering profession in America. But the next half of the century was the time of increasing recognition of engineers and an increased feeling on the part of the engineers themselves of the importance of their work and the contribution which they were making or would ultimately make toward the economic well being of the nation.

The growing consciousness of engineers and their belief in the profession led to the organization of technical societies. This began with the formation of the American Society of Civil Engineers in 1852. The next one to be formed was the American Institute of Mining and Metallurgical Engineers in 1871. In 1880, the Mechanical Engineers organzied the American Society of Mechancial Engineers, and four years later saw the birth of the American Institute of Electrical Engineers. The year 1893 saw the founding of the American Society for

Engineering Education, which was a little different from the four preceding Societies, but which indicated the growth of engineering schools and the consciousness of the importance which they were destined to play in the United States. The order in which these Societies were formed gives a good idea of the chronology of the development of the various branches of engineering. Thus it was not until 1908 that the American Institute of Chemical Engineers was formed, illustrating the fact that it was only in the last years of the 19th Century that the possibilities of chemical engineering began to be understood and a definite field for chemical engineers was recognized.

These Societies were first and foremost technical societies, interested primarily in the technological development of their members and in producing reference libraries which would be of assistance to all engineers operating in the repsective fields. As time went on, of course, the social and economic aspects of the lives of the members were recognized as having importance. Various efforts were made by each society to bring to the front the importance of the social and economic well being of their members. The limitations of these societies, due to their being interested primarly in one single phase of engineering, made it difficult for them to study or to assist in the overall picture of the economic advancement of engineers. Then, too, the divisions of the profession into individual branches tended to emphasize the difference between the branches of engineering and to increase the difficulty for getting united action. During the 20's these Societies made an attempt to form an organization to deal with problems of mutual interest but due to the unwieldiness of it, it was not successful and did not survive. Later, the Engineering Joint Council was formed along similar lines and is still operating with varying degrees of success. Its principal handicaps are its lack of authority and the inherent difficulty in deciding upon a course of action which is simultaneously acceptable to all the member societies; and the absence of any direct contact between the Council and the individual engineer.

In 1934 the National Society of Professional Engineers was organized, dedicated solely to the interest of the professional engineer along economic, social and professional lines. It represented the first attempt to define professional engineering, to recognize the legal status of engineers as defined by the various license laws in the several states, and to coordinate engineers of all branches in a single organization. The society was slow in getting started, but since the close of the war its growth has been healthy and now, with a membership considerably in excess of 25,000, it begins to rank among the larger of the engineering societies. It appears that the idea is taking hold more and more among engineers and that in another decade it may very

probably be the voice which represents the engineers on subjects which affect them as a whole.

As each new section of the country has developed, the first member of the engineering profession to show up has been the civil or the mining because, except in a few places where mining was the original attraction, the first man who attains prominence in a community is the man who can make land surveys and give advice as to the construction of roads, bridges and similar facilities. Later, with the construction of power plants, and heating plants, the merchanical engineer is wanted and as the generation and use of electricity develops, the electrical engineer comes into prominence. And it is only after certain specialized types of industry move into a vicinity that the need arises for the most modern division of the profession, namely the chemical engineer.

The growth of engineering in the United States is well illustrated by the development over the last 40 years. In 1910, the estimated number of engineers who might be classed as professional engineers, was 85,000. In 1947, the number had grown to 320,000, and as of 1950, probably had reached 350,000. Thus we see that in the 40 year period between 1910 and 1950 the population of our nation grew 65%, while during the same period the number of professional engineers increased 300%. In 1910 there was less than one engineer per 1,000 population, while in 1950 there were 2.3 engineers per 1,000 population. The development of any region industrially can now be fairly well estimated by the number of engineers employed in that community. For example, in Kansas, which has relatively less industry than the average of the nation, there is at present one engineer for each thousand inhabitants as compared to the 2.3 per thousand as the national average. 73% of all the engineers in the United States live east of the Mississippi River.

It appears evident that engineers are justified in taking a fair share of the credit for the development of mass production in the United States and making possible the application of mass production methods to all phases of manufacturing and production and without doubt these methods have made possible the standard of living now enjoyed by the average citizen in the United States. It is, of course, to be deplored that it has been found necessary to keep so many scientists and engineers working for the past ten years in perfecting machines of war, machines designed for the destruction of our fellow man. The engineers have devoted their abilities to this problem with the same diligence and the same success as they have to the peace time pursuits. It is to be fervently hoped that world conditions will soon make it

possible for these men to turn their attentions to matters which will directly benefit the human race rather than to those things which might ultimately destroy it.

World War II ushered in what we might well call a golden age of engineering. The war brought the engineer into the limelight as never before, and during that period more people learned of the work, the accomplishments and the overall value of engineering services than ever before.

This situation, coupled with a scarcity of engineers, resulted in relatively better pay, better working conditions and better recognition than had ever before been accorded the engineering profession. We are again starting on a period of intense preparedness which it is hoped will not develop into another period of general shooting war. If the trouble is headed off by the preparations, even this will again serve to emphasize the value and need of engineering services and the mere fact of the dislocation of men of college age will again add to the scarcity of engineers.

All this adds up to what appears to be a continuance of the rather favorable conditions that have surrounded the engineering profession through the last decade. The direction in which the development takes place is a matter which the engineers themselves, and particularly the young members of the profession, will have to decide. It is a time when engineers will have to decide whether or not they will become really professional men. The alternative, of course, is to slip into a niche in the skilled trades and throw in our lot with the trade unions. It is conceivable that such a move might result in better financial remuneration, temporarily, at least, but in the opinion of this writer, it would be the death knell of the real usefulness of engineers to our civilization.

But each young engineer, as he goes into the practice of the profession, must make up his mind whether he wants to be a professional man or a tradesman. Professionalism is essentially a state of mind; it is evidenced by the attitudes which one has toward one's work. It is the opposite of the clock-watcher; it is the opposite of the man who always asks first, how much money is there in it, or do I have assurance that I will be paid. It is rather the attitude that the work itself is the matter of first importance and is evidenced by a devotion to the principle of a man devoting himself and his brain the best that he knows how to the problems which come his way to be solved.

To be a good engineer, a man must be, first, a good citizen with all the characteristics which that term may imply. A tradesman does his job because he is getting $2.00 an hour, with time and a half for overtime and double time for Sunday. The professional man is interested

primarily in his job and if he undertakes to carry out an assignment, will do that job equally well whether his reward runs into large figures financially or whether in the end he finds that he has to do it for nothing. There can be no gains in this world without corresponding sacrifice and if the engineers wish to be ranked among the great professions of our civilization, they will have to develop a professional viewpoint and the professional outlook toward their work and toward their fellow human beings which in the past too many engineers have not possessed.

It seems to me that the possibilities lying ahead for the young engineer are practically unlimited, and any young man who wants to devote himself wholeheartedly to the job of being an engineer will find ample reward for tackling the job on a really professional basis.

FOUNDER OF SIGMA TAU HONORED BY UNIVERSITY OF PORTLAND

J. C. Stevens, one of the founders of Sigma Tau and one time national president, treasurer of Leupold & Stevens Instruments, Inc., was named a Northwest leader who has made "during the past 50 years, the greatest contribution to the strength of the region by the practice of his profession." He received a formal award as one of six outstanding professional men selected by the University of Portland in connection with the University's Golden Jubilee. Official presentation of the award was made at a campus dinner attended by educators, professional men and civic leaders.

J. C. Stevens represented the field of Engineering. Other awards were made in the fields of Science, Business, Music, Medicine and Law.

Besides his connection with Leupold & Stevens Instruments, Inc., as an inventor and business man, J. C. Stevens is partner in the firm of Stevens & Koon, consulting engineers, and is a past president of the Society of American Civil Engineers. Oregon State College conferred on him in 1938 an honorary degree of Doctor of Science. Active in civic affairs, he is also currently president of the Oregon Museum of Science and Industry.

TED R. GRIEST, EPSILON '22 HOLDS STATE OFFICE

Ted R. Griest of the architectural firm of Griest and Ekdahl, Topeka, Kansas, has been reappointed to the Kansas State Registration and Examining Board of Architects by Governor Carlson.

ROBERT C. RUPERT, ALPHA CHAPTER RECEIVES SIGMA TAU GRADUATE FELLOWSHIP AWARD

Robert C. Rupert, University of Nebraska student, is the winner of the national 1951 Sigma Tau Graduate Fellowship for excellence in engineering studies.

The members of the committee making the selection this year were: Professor Benjamin C. Cruickshanks, head of the Mechanical Engineering department, George Washington University (Xi chapter); Roy L. Swenson, Engineer Supervisor, National Park Service, Washington, D. C. (Epsilon chapter); Stanley Bracken, President Western Electric Company, New York City (Alpha chapter), and Paul S. Ballif, Bureau of Standards, Washington, D. C. (Rho chapter).

Brother Rupert is an ex-GI whose university education was interrupted by World War II. He received his bachelor of science degree in Chemical Engineering at the end of the first semester of this year and has been doing post-graduate work at the University of Nebraska during the second semester.

The award of $500 will permit him to take additional advanced work at the University of Colorado toward a master of science degree.

SIGMA TAU SUCCEEDS SIGMA TAU AS DEAN OF SCHOOL OF ENGINEERING PENNSYLVANIA STATE COLLEGE

Dr. Harry P. Hammond who retired last fall as dean of the School of Engineering at Pennsylvania State College was succeeded by Dr. Eric A. Walker. Both are members of Sigma Tau.